

Claims

What is claimed is:

1. A system comprising:
a detector configured to detect a clipping condition in an audio signal;
a signal processor coupled to receive a feedback signal from the detector;
wherein the signal processor is configured to modify the audio signal in response
to the feedback signal received from the detector.
2. The system of claim 1, wherein modification of the audio signal by the signal processor is variable.
3. The system of claim 1, further comprising a noise shaper, wherein the detector is coupled to the noise shaper and configured to detect the clipping condition in the audio signal in the noise shaper.
4. The system of claim 3, wherein the system comprises one or more components of a digital audio amplifier.
5. The system of claim 1, wherein the signal processor is configured to modify the audio signal by clipping the audio signal.
6. The system of claim 1, wherein the signal processor is configured to modify the audio signal by compressing the audio signal.

7. The system of claim 6, wherein the signal processor is configured to modify the audio signal by compressing only a portion of the audio signal that exceeds a threshold level.
8. The system of claim 1, further comprising a filter coupled between the detector and the signal processor, wherein the filter is configured to filter the feedback signal of the detector.
9. The system of claim 8, wherein the clip filter comprises a counter that is incremented for each clock cycle in which the output signal of the clip detector is asserted and that is reset on each clock cycle in which the output signal of the clip detector is not asserted.
10. The system of claim 9, wherein the clip filter is configured to assert the filtered output signal when the counter reaches a threshold level.
11. The system of claim 8, further comprising a flag circuit coupled between the filter and the signal processor, wherein the flag circuit is configured to receive the filtered feedback signal and, if the filtered feedback signal is in an asserted state, to maintain the filtered feedback signal in the asserted state until the flag circuit is reset by the signal processor.
12. The system of claim 1, wherein the clipping condition comprises simple clipping of the audio signal.
13. A method comprising:
detecting a clipping condition in an audio signal;
modifying the audio signal in response to detecting the clipping condition.

14. The method of claim 13, wherein modifying the audio signal comprises modifying the audio signal in a variable manner.
15. The method of claim 13, wherein detecting the clipping condition in the audio signal comprises detecting the clipping condition in the audio signal in a noise shaper.
16. The method of claim 15, wherein the audio signal output by the noise shaper is amplified in a digital audio amplifier.
17. The method of claim 13, wherein modifying the audio signal comprises clipping the audio signal.
18. The method of claim 13, wherein modifying the audio signal comprises compressing the audio signal.
19. The method of claim 18, wherein modifying the audio signal comprises compressing only a portion of the audio signal that exceeds a threshold level.
20. The method of claim 13, further comprising filtering a feedback signal corresponding to a detected clipping condition, wherein modifying the audio signal in response to detecting the clipping condition comprises modifying the audio signal in response to the filtered feedback signal.
21. The method of claim 20, wherein filtering the feedback signal comprises incrementing a counter in response to assertion of the feedback signal and resetting the counter in response to de-assertion of the feedback signal.
22. The method of claim 21, wherein filtering the feedback signal further comprises asserting the filtered feedback signal when the counter reaches a threshold level.

23. The method of claim 20, further comprising, if the filtered feedback signal is asserted, maintaining assertion of the filtered feedback signal until the audio signal is modified in response to the filtered feedback signal.

24. The method of claim 13, wherein the clipping condition comprises simple clipping of the audio signal.